REMARKS

The above amendment is made in response to the Office Action of September 5, 2002. Applicant has enclosed herewith a copy of the marked-up version of the amended claims as required by 37 C.F.R. §1.121. The Examiner's reconsideration is respectfully requested in view of the above amendment and the following remarks.

Claim 5 has been canceled, without prejudice. Claims 1-3, 6-13, 15 and 16 have been amended. Claims 1-3, 6-16 and new claims 17-19 are pending in the present application.

In the Office Action, claims 1-3 and 5-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Horie (U.S. Patent No. 5,928,428), Tanaka (U.S. Patent No. 5,091,207), Nozawa et al. (U.S. Patent No. 5,290,381) and/or Limb et al. (U.S. Patent No. 5,352,615).

In the amendment, claim 1 has been amended to more particularly set forth Applicant's invention. Specifically, claim recites, *inter alia*, a first ozone transfer unit for providing a reactor with ozone to be used for a thin film deposition on the wafer, wherein the ozone and a reaction gas are provided into the reactor at respective times different from each other; an ozone control unit connected to an ozone generator in parallel with the first ozone transfer unit, for receiving the ozone from the ozone generator to allow a certain amount of ozone to flow to the first ozone transfer unit by removing an excessive amount of ozone generated by the ozone generator; a first selection valve connected between the first ozone transfer unit and the reactor, for controlling a flow of the ozone from the first ozone transfer unit to the reactor; and a second selection valve connected between the first ozone transfer unit and an exhaust pump, for controlling a flow of the ozone from the first ozone transfer unit to the exhaust pump, wherein the first and second selection valves perform opposite operations at a same time.

Applicant respectfully submits that the features of amended claim 1 are not taught or suggested by the cited prior art references. Thus, it is respectfully submitted that the subject matter of amended claim 1 is not rendered anticipated or obvious by the cited references, either individually or in combination.

Claims 2, 3 and 6-16 depend directly or indirectly from independent claim 1, thus, include all the limitations of claim 1. It is thus believed that claims 2, 3 and 6-16 are allowable due to their dependency on claim 1 which is believed to be allowable for at least the reasons stated.

New claims 17-19 have been added to further define the present invention.

In view of the foregoing amendments and remarks, it is respectfully submitted that all the claims now pending in the application are in condition for allowance. Early and favorable reconsideration is respectfully requested.

If there are any charges due with respect to this response, please charge them to Deposit Account No. 06-1130 maintained by Applicant's Attorneys.

The Examiner is invited to contact Applicant's Attorneys at the below-listed telephone number with any questions or comments regarding this response or otherwise concerning the present application.

Respectfully submitted,

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MARKED UP VERSION TO SHOW CHANGES MADE

IN THE CLAIMS:

1. (Twice Amended) A semiconductor thin film deposition apparatus comprising:

[at least one] a reactor in which a wafer is received;

[a gas supply portion for supplying a reaction gas or inert gas to the reactor, wherein the gas supply portion includes:

at least one] a reaction gas supply unit for [selectively] providing [the] reaction gas to the reactor; [and]

an inert gas supply unit for providing [the] inert gas to the reactor;

an exhaust pump for exhausting gas from the reactor; [and

an ozone supply portion for generating ozone to react with the reaction gas, wherein the ozone supply portion includes:]

an ozone generator for generating [the] ozone to react with the reaction gas;

[at least one] a first ozone transfer unit for [transferring ozone to] receiving the ozone from the ozone generator to provide the reactor with ozone to be used for a thin film deposition on the wafer, wherein the ozone and the reaction gas are provided into the reactor at respective times different from each other;

[and

a selection transfer member for selectively transferring ozone provided from the at least one ozone transfer unit to the reactor or the exhaust pump,

wherein supply of the reaction gas from the gas supply portion and the ozone from the ozone supply portion to the reactor is controlled such that a thin film is deposited on the wafer at a thickness of an atomic layer by varying inflow duration of the reaction gas or the ozone.]

an ozone control unit connected to the ozone generator in parallel with the first ozone transfer unit, for receiving the ozone from the ozone generator to allow a certain amount of ozone to flow to the first ozone transfer unit by removing an excessive amount of ozone generated by the ozone generator;

a first selection valve connected between the first ozone transfer unit and the reactor, for controlling a flow of the ozone from the first ozone transfer unit to the reactor; and

a second selection valve connected between the first ozone transfer unit and the exhaust pump, for controlling a flow of the ozone from the first ozone transfer unit to the exhaust pump, wherein the first and second selection valves perform opposite operations at a same time.

2. (Twice Amended) The semiconductor thin film deposition apparatus of claim 1, [wherein the ozone supply portion comprises:] further comprising

a main valve disposed between the ozone generator and the first ozone transfer unit, for controlling a flow of the ozone from the ozone generator to the first ozone transfer unit[; and

an ozone control unit for allowing a certain amount of ozone to flow to the ozone transfer unit by removing an excessive amount of ozone generated by the ozone generator].

3. (Amended) The semiconductor thin film deposition apparatus of claim 2, [wherein the ozone transfer unit comprises:] further comprising

[a process ozone transfer member for transferring ozone used in a thin film deposition process; and]

a [thermal treatment] second ozone transfer [member] unit for [transferring] receiving the ozone from the ozone generator to provide the reactor with ozone to be used [in] for a thermal treatment [process] on the wafer, wherein the second ozone transfer unit is connected to the ozone generator via the main valve in parallel with the first ozone transfer unit and the ozone control unit, wherein the ozone control unit allows a certain amount of ozone to flow to the second ozone transfer unit by removing an excessive amount of ozone generated by the ozone generator, and the main valve controls a flow of the ozone from the ozone generator to the second ozone transfer unit.

6. (Amended) The semiconductor thin film deposition apparatus of claim 3, wherein the [process] first ozone transfer [member] unit comprises:

a first [process] ozone transfer valve having an inlet connected to an outlet of the main valve [in parallel] of which inlet is connected to an outlet of the ozone generator; [and]

a [process] first mass flow controller [and a second process valve sequentially] having an inlet connected to an outlet of the first [process] ozone transfer valve, for controlling a flow rate of the ozone to be used for the thin film deposition on the wafer; and

a second ozone transfer valve having an inlet connected to an outlet of the first mass flow controller and an outlet generating the ozone to be used for the thin film deposition to the first and second selection valves.

7. (Amended) The semiconductor thin film deposition apparatus of claim [3] 6, wherein the [thermal treatment] second ozone transfer [member] unit comprises:

a [first thermal treatment] third ozone transfer valve having an inlet connected to the outlet of the main valve [in parallel]; [and]

a [thermal treatment] second mass flow controller [and a second thermal treatment valve sequentially] having an inlet connected to an outlet of the [first thermal treatment] third ozone transfer valve, for controlling a flow rate of the ozone to be used for the thermal treatment on the wafer; and

a fourth ozone transfer valve having an inlet connected to an outlet of the second mass flow controller and an outlet generating the ozone to be used for the thermal treatment to the first and second selection valves.

8. (Amended) The semiconductor thin film deposition apparatus of claim [6] 7, wherein the [process] first mass flow controller controls the flow rate of the ozone [up to] to be used for the thin film deposition in a range from about 100 sccm to about 500 sccm.

9. (Amended) The semiconductor thin film deposition apparatus of claim [7] 8, wherein the [thermal treatment] second mass flow controller controls the flow rate of the

ozone [up to] to be used for the thermal treatment in a range from about 100 sccm to about 20000 sccm.

10. (Amended) The semiconductor thin film deposition apparatus of claim [2] 7, wherein the [excessive] ozone control unit comprises;

an automatic pressure valve [and an ozone remover which are installed on the line between the main valve and] connected to the ozone generator in parallel with the main valve, [and the automatic pressure valve is] for being automatically opened to receive the ozone from the ozone generator when [the] pressure of the ozone generated from the ozone generator is equal to or greater than a predetermined value[,]; and

[the] an ozone remover [removes] for receiving and removing ozone which has passed through the automatic pressure valve.

11. (Twice Amended) The semiconductor thin film deposition apparatus of claim 10, wherein the [excessive] ozone control unit further comprises a check valve [member] connected between the main valve and the ozone remover, for allowing the ozone passing through the automatic pressure valve to flow [from the main valve to] only toward the ozone remover when [ozone] pressure [determined by an amount] of the ozone generated [by] from the ozone generator is equal to or greater than [a] the predetermined value.

12. (Amended) The semiconductor thin film deposition apparatus of claim [1] 7, further comprising a heater for providing [a temperature] heat to perform the thermal treatment on [a] the wafer [received in the reactor] in the reactor.

13. (Amended) The semiconductor thin film deposition apparatus of claim 12, wherein the heater provides the heat at a temperature in a range [of] from about 300 °C to about 700 °C.

14. The semiconductor thin film deposition apparatus of claim 1, wherein the inert gas is argon.

15. (Amended) The semiconductor thin film deposition apparatus of claim [3] 7, wherein the [process] first ozone transfer [member transfers] unit provides the ozone to the reactor at a first flow rate in [a] the thin film deposition process [for the wafer], and the [thermal treatment] second ozone transfer [member transfers] unit provides the ozone to the reactor at a second flow rate in [a] the thermal treatment process [for the wafer].

16. (Amended) The semiconductor thin film deposition apparatus of claim 1, wherein [inflow of] the inert gas supply unit provides the inert gas into the reactor [occurs] at a time between [inflows of] when the reaction gas supply unit provides the reaction gas into the reactor and when the first ozone transfer unit provides the ozone into the reactor.